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GEORGE JAMES GUTHRIE, F.R.S.
(1785-1856)

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BRITISH MASTERS OF OPHTHALMOLOGY SERIES

9.—GEORGE JAMES GUTHRIE, F.R.S., (1785-1856).

Founder of the Royal Westminster Ophthalmic Hospital

BY

HAROLD GRIMSDALE,

LONDON

GEORGE JAMES GUTHRIE, the subject of this short memoir, is rightly held by all British ophthalmologists as one of the founders of their science. Yet if we regard him, as we ophthalmic surgeons are apt to do, as primarily one of our own members, we shall lose sight of what is by far the largest part of his life work. Guthrie was perhaps the most distinguished army surgeon that has ever served in our forces, and if, incidentally, during that career he strove for ophthalmology, it was but for a part of the greater whole.

Here, in these pages, in recalling our debt to Guthrie, we shall naturally pay more attention to his ophthalmic work than to his contributions to general surgery; these have been written of elsewhere in the *Journal of the Royal Army Medical Corps*, 1910, and in the *British Journal of Surgery*, Vol III, 1915-1916.

G. J. Guthrie was born on May 1, 1785. His family was connected with the medical profession; his great grandfather had been present as surgeon at the battle of the Boyne, and his father assisted and succeeded his maternal uncle (who had been a surgeon in the Navy) in the manufacture and supply of medical stores, more especially of an improved form of emplastrum lithargyri, from which he made a considerable fortune.

Guthrie's education was undertaken, in part at least, by the Abbé Noel, a French emigré, and from him Guthrie acquired so good a knowledge of French that he was sometimes mistaken for a native of France. During his fourteenth year, as the result of a serious accident, he came under the care of Mr. Rush, then Inspector-General of military hospitals, and he, taking an interest in the boy, proposed to his father that he should be educated for the profession of medicine. As a result of this suggestion, Guthrie was articled as pupil of Mr. Phillips, of Pall Mall, and the particular pupil of Dr. Hooper, of the Marylebone Infirmary. In 1800, being then but 15, he was appointed hospital mate and dresser under Mr. Carpue, surgeon to York Hospital, Chelsea, and staff surgeon to the Army (1798-1807). His knowledge of French, and the interest in foreign languages, which he imbibed from the Abbé, served him in good stead in the Peninsula in later years.

In March, 1801, an order was issued that no unqualified hospital mate should attend the sick in these hospitals; on hearing of this order, Guthrie immediately put down his name for examination, and two days later was examined and passed. He was very shortly after appointed to the surgeoncy of the 29th (now the Worcestershire) Regiment, and accompanied them first to the American and afterwards to the Peninsular War. His Colonel was only 22, and Guthrie was but 16, yet the command of the regiment and its medical appointments were as efficient as any in the Army. Guthrie served throughout the whole of the Peninsular War. He was wounded at Vimiero, and again at Oporto, and was invalided for some time from fever. At the passage of the Douro his gift of languages was of service to him; he was enabled to persuade a Portuguese peasant to ferry him across the river, and it is said he was the first mounted officer across. On the far side he met a French gun entangled in a narrow lane, and by cutting the harness he prevented its removal. In doing this he became separated from his regiment, and therefore attached himself to a battalion of Portuguese. In their company he met an English regiment, who, mistaking the uniform for French, were about to open fire; Guthrie, running forward, tore open his great coat, and showed under it his scarlet tunic; this was recognized by the English, and what might have been a disaster averted.

At Albuera, he was sole medical staff officer in charge of 3,000 wounded. In 1812 he was appointed Deputy Inspector of Military Hospitals. When Sir Rowland Hill withdrew from Madrid to Salamanca, Guthrie conducted the retreat of the Hospital train, and although the stores were lost, the Hospital and all the sick were saved; it was the first time that a British army had made so long a retreat without losing its Hospital and sick. After this action, Guthrie was highly praised by Wellington for his skill and care. The regiment also appreciated Guthrie's ministrations; it is said that they had good reason to do so as the death rate was but half that of many of the other regiments, and the men attributed this to Guthrie's attention.

He always strongly advocated the principle of regimental hospitals; he held that the men were not only better looked after, but that they were returned to their regiments more speedily. It was largely Guthrie's professional skill and organizing ability which gained for the surgeons of the British Army that high reputation which they enjoyed among all surgeons of that time. Guthrie established the practice of ligaturing both ends of a wounded artery in preference to the Hunterian operation of tying it above the injury, and thus saved many limbs.

In 1814 he returned to England and was at once put on half pay. He renewed the study of anatomy at the school in Windmill Street (the old building is still standing) and attended the practice of the Moorfields Eye Hospital (then the London Infirmary for the Cure of Diseases of the Eye).

When Napoleon escaped from Elba and began the campaign that ended at Waterloo, Guthrie did not feel able to abandon his professional work in London, since this would have involved the cessation of the help which he was giving to his family, and therefore did not at once join the Army, much to the regret of his brother officers. However, after the Battle of Waterloo, urged by his old chief, Sir James McGrigor, he left England for Brussels to put his skill at the disposal of the medical officers there. It is said that his action in leaving London gravely offended the only two patients he had, who refused ever to speak to him again. Under these circumstances his future, on his return to England, appeared dark indeed, but his friend, Sir James McGrigor, gave him charge of two large wards in the York Hospital in London, and the fame of Guthrie increased rapidly as the success with which he treated the desperate cases sent him became known.

He felt deeply the necessity for greater opportunities of instruction for the medical officers of the Army, and therefore began a course of lectures to which all officers of the services were welcomed without fee. At the conclusion of the first course the grateful audience presented him with a silver cup as "an inadequate but

sincere memorial of their admiration of his great professional ability." This cup passed into the possession of his daughter, Miss Guthrie, and was presented by her to Mr. Henry Power, who had been a student of her father ; it is now in the possession of Mr. D'Arcy Power.

Guthrie was specially struck by the absence of any systematic instruction on the subject of diseases of the eye, and by the slender provision in London for the treatment of these conditions. Moorfields was the sole special hospital ; a similar institution "under Royal Patronage in Westminster," opened in the winter of 1804-1805, appears to have collapsed. This brings us to the action which must always be the chief claim on our remembrance, viz., the foundation of the institution which is now the Royal Westminster Ophthalmic Hospital. This was first mooted by Guthrie little more than a year after Waterloo. His acquaintance with the heads of the Army and their knowledge of his services, ensured for the venture its primary support. The first public notice of the proposed infirmary is in the *Morning Chronicle* for Saturday, Dec. 7, 1816 :

"THATCHED HOUSE TAVERN, 5th Dec., 1816.

The Right Honourable Lord LYNEDOCH in the Chair.

At a numerous MEETING of NOBLEMEN and GENTLEMEN, it was proposed to establish an INFIRMARY for the CURE of DISEASES of the EYE in the Western part of the Metropolis, for the Relief of the Poor and as a School of Instruction ; certain Resolutions were adopted to promote this important object and a Committee appointed to make the necessary arrangements for the establishment of the Institution.

Patron—His Royal Highness the Duke of YORK, K.G.

President—His Grace the Duke of WELLINGTON, K.G.

That a Committee be formed for the purpose of regulating the affairs of the Institution, who will report their proceedings to the next General Meeting of the Governors.

President, Lord Lynedoch. Members, Sir Thomas Bell, S. Reed, Esq., Treasurer, Dr. C. F. Forbes, G. J. Guthrie, Esq.

That the Medical Officers of the Establishment consist of one Physician, viz., Dr. C. F. Forbes, Member of the Royal College of Physicians, Physician to his Royal Highness the Duke of Kent, and to the Surrey Dispensary, Deputy Inspector of Military Hospitals, etc., etc. ; and of one Surgeon, viz., Mr. Guthrie, Member of the Royal College of Surgeons, Deputy Inspector of Military Hospitals, Lecturer on Surgery in London, etc., etc.

That to give immediate effect to this Institution, the poor will be relieved, until a proper place can be provided, on Mondays, Wednesdays and Fridays, between the hours of half-past nine and

eleven o'clock, at Mr. Guthrie's house, No. 2, Berkeley Street, Berkeley Square."

The original title of the charity was the "Royal Westminster Infirmary for the cure of Diseases of the Eye."*

The hospital was first placed in Mary-le-bone Street, Piccadilly (which is now the eastern part of Glasshouse Street), and afterwards in Warwick Street, Golden Square; finally, in 1832, it was removed to its present site under the title of the "Royal Westminster Ophthalmic Hospital." It soon proved of great value to the poor. It was stated at a meeting of the Governors in May, 1825, that some 10,000 poor people had already received attention there, and the Director-General, Sir James McGrigor, drew attention to the fact that the Institution was the chief teaching centre for the officers of the Army Medical Service in this special subject. On the same occasion the Duke of Wellington spoke highly of the value of the work. Guthrie's interest in the better education of the Army medical officers has been already mentioned. In the charter of the hospital it is specially laid down that all members of the medical services of the Army or Navy are to be admitted to the practice of the hospital and to the systematic course of instruction without fee. Guthrie himself gave the systematic lectures for many years, and the rule which, there is little doubt, he made, still binds the staff.

For the first ten years, Guthrie and his colleague Forbes were the sole medical officers; in 1827 Forbes retired, after an unfortunate disagreement with his colleague; there was great feeling over the affair, and Forbes fought a duel with one of the pupils of the Hospital on Clapham Common. The details of the quarrel may be found by those interested in the *Lancet*, but cold controversy is dull reading. Guthrie was hurt by the expressions of the *Lancet*,† and threatened an action for libel, which eventually he did not proceed with. Clarke, in his *Recollections*, adverting to this point, says that, in the opinion of his contemporaries, Guthrie would certainly have secured heavy damages, but adds that he was as adverse to pressing his personal grievances as he was indefatigable in fighting for anything which he believed to be for the public good.

About this time, May, 1827, Guthrie was elected a Fellow of the Royal Society, being described as "a gentleman well versed in various branches of natural knowledge." The certificate is signed by his friend Henry Kater and eight others.

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* It is not clear whether this had any relation to the similar Institution mentioned above.

† The *Lancet* cannot have felt very easy in the matter, for the Editor wonders that Guthrie should have been disturbed by "such a contemptible squib" as the effusion of their own correspondent, but appeals to the freedom of the Press to justify the publication of it.

From 1827 to 1838 Guthrie carried on the work of the Hospital singlehanded; in that year the staff was increased by the addition of his son, Charles Guthrie, and they carried on (with the assistance of Mr. Knox, the "Honorary Cupper,") until 1841.

It was not in the betterment of Army medical education alone that Guthrie was a pioneer.

In another direction, also, he was in advance of his time; I have before me a copy of a small tract entitled—

ON
THE CERTAINTY AND SAFETY
WITH WHICH
THE OPERATION
FOR THE
EXTRACTION OF A CATARACT
FROM
THE HUMAN EYE MAY BE PERFORMED,
AND
ON THE MEANS BY WHICH IT IS TO BE ACCOMPLISHED.
BY G. J. GUTHRIE, F.R.S.
WITH REMARKS BY CAPTAIN KATER, F.R.S.,
ON
CERTAIN SPOTS DISCOVERABLE
IN
THE HUMAN EYE
AND ON
THE MANNER OF DETECTING THEIR SITUATION.

This is "published by order of the Committee and sold for the benefit of the Royal Westminster Ophthalmic Hospital."

The chief interest is found on the second page of the title; there it is described as "the first special report" of the Hospital "on particular diseases and operations," and is dated 1834. He thus anticipated the foundation of the Moorfields Hospital *Reports* by nearly a quarter of a century.

Unfortunately, the records of the Hospital are very scanty, and I have not been able to find any details concerning this report, nor why it was not followed by others. There are several points of interest in this *Report*; the first is the bold advocacy with which Guthrie strived to establish the operation of extraction. His clinical experience taught him the advantage of the operation over either couching or discission in cases of hard cataract, and he had the courage to urge this when the majority of the profession were adverse. Secondly, "there is another secret to be disclosed of yet greater importance to the young operator; it is that the effect of an injury to the iris is very greatly over-rated." He shows that

a wound of the iris during the section of the cornea was of comparatively little importance; but he explains how injury to the iris may be avoided by a movement "to raise the eye, or in other words to draw it as it were out from the orbit," at the same time pressing on the cornea. He then goes on to show how a large quantity of vitreous may be lost without any serious damage, and quotes cases where, after the section was made, the lens was expressed from the eye by the action of the external muscles together with a large proportion of the vitreous, and yet a good result followed.

I have extracted somewhat freely from this little work, because it shows how fully Guthrie gave his knowledge to his pupils.

It is clear that he was an enthusiastic teacher, with a genuine love of his work, and there is therefore no cause for wonder that his pupils valued his teaching.

It seems probable that his great professional activities interfered with the publication of succeeding *Reports*, as they seem also to have prevented the publication of the lectures on the anatomy of the eye which Guthrie promises in his book on the surgery of the eye, published in 1823; this was the first part of his lectures at the Royal Westminster Ophthalmic Hospital, and it is to be regretted that the second part, consisting of the lectures on the anatomy of the eye and the diseases which did not admit of operation, never saw the light. The lectures were probably given from brief notes only, and the labour in arranging them for publication was too great an addition to his strenuous life. In the section on cataract, there is the first mention of the zonular form; this he describes as a small lens, but from the description and the plate, there can be no doubt of the real fact.

Guthrie was three times President of the Royal College of Surgeons, *viz.:* in 1833, 1840, and 1854. He suggested the publication by the College, of "Transactions," but this, like the "Reports" of the Royal Westminster Ophthalmic Hospital, came to an early end. Guthrie prepared a paper on hernia, to be read to the Museum Committee, but the minutes report that no quorum was obtained and the lack of interest smothered a valuable project.

Guthrie died on his birthday, May 1, 1856.

Of his work on general surgery, I do not propose to speak at length. Let it suffice to say that the treatise on Gunshot Wounds is still read with attention; the Librarian of the Medical Society tells me that a copy in that library has been constantly borrowed by surgeons in France during the present war; this is a tribute to a work which is now more than one hundred years old.

Guthrie's skill was recognized by his contemporaries; he seems to have been a man of considerable strength of character, rather hot-tempered and irascible, but with a great and real kindness of

heart. It is recorded that he was feared as an examiner, because of his brusque manners, but that he was, in truth, less severe than many of his colleagues. His firmness in pursuing what he believed to be for the public good, as well as his disregard for his own private wrongs, has been mentioned by all his contemporaries.

There are many portraits of him; the best known, that in the Secretary's room at the Royal College of Surgeons (reproduced also in Pettigrew's Medical Portrait Gallery), is not the most pleasing.

The bust by Chantrey, in the Gallery, gives the impression of a much finer man, with a large outlook and wide sympathies. The bust in the "Guthrie" Ward of the R.W.O.H. is not a successful work of art.

A very life-like little sketch (reproduced here) is to be found in the *Lancet* for 1850.

I have to thank Mr. D'Arcy Power and Professor Keith for their kind help in the collection of material on which this short memoir is based.

COMMUNICATIONS

ON MAXIMAL INSTILLATION OF COCAIN AND OF ESERIN IN CATARACT EXTRACTION

BY

H. HERBERT, Lieut.-Colonel, I.M.S.,

KARACHI, INDIA.

OPERATING for cataract in Sind, Northern India, during the past two years, local conditions have been largely responsible for a number of departures from the accepted routine procedure. Two of these changes are well worth consideration as valuable measures for at least occasional adoption elsewhere.

Prolonged instillation-period of cocain and adrenalin. Sindhis as a whole strike a lower average in self-control during operation than any body of patients which I have yet met. They are timid, suspicious, and bear pain badly. Consequently operations with only the usual preparation of the patient are too frequently nerve-wracking ordeals for the surgeon, and are unfair to the patient. One is forced to operate as frequently as possible under the full, or nearly full, influence of cocain. The stage reached in anaesthesia of the iris may be gauged fairly well by the degree of dilatation of the pupil attained under the combined instillation of adrenalin and cocain. As a general rule the dilatation must be rather wide if the patient is to be guaranteed free from pain on pulling or rubbing the

iris. In our busy and imperfectly organized hospital practice, however, we have often begun operating upon eyes somewhat imperfectly anaesthetized, while, on the other hand, the later patients of a batch have occasionally been kept waiting for their turn some considerable time after they were quite ready for operation. So that we have had a fair experience both of over-use (? abuse) and of insufficient use of cocain.

The strong conjunctival reaction produced by our maximal perchloride irrigation delays the absorption of the adrenalin and cocain instilled, so that as much as thirty-five minutes has been at times occupied in obtaining complete anaesthesia. Adrenalin solution 1 in 1,000, is used once immediately after the perchloride washing, and a second time later if the eye remains injected. Four per cent. cocain drops are used every two, three, or four minutes, according to circumstances.

Even in cases where the cocain instillation has been prolonged beyond the desired stage, as above, trouble from drying of the cornea seems to be readily avoided by keeping the eyes closed between the instillations, and by dropping sterile water on the cornea after insertion of the speculum, and continuing it as appears necessary afterwards during the operation With the lids closed, and with any excess of fluid at once mopped up from the lid margins after each instillation, apparently little or no fluid passes down into the nose to give rise to general symptoms.

Particularly in cases in which adrenalin has been used more than once, and in which the cocain instillation has been unusually prolonged, the palpebral aperture not infrequently remains imperfectly closed afterwards. On gentle closure of the lids, as in sleep, the aperture may remain 2 or 3 mm. wide. And though the upper lid can be readily pushed into position, and retained there by the application of a cotton-wool pad without pressure, one would prefer natural closure, at least in cases in which a lower section has to be made. (A large proportion of lower sections are made in Karachi, as we have found it best in many instances to allow the patient to look where he pleases during the operation. But our lower sections are always more or less sub-conjunctival, the conjunctival flap being left undivided at the lower fornix.)

In a case narrated below, this imperfect closure of the lids apparently interfered with the local penetration of eserin drops used after operation.

Further observation is needed to dispose of the question whether other troubles or dangers may possibly arise from over-use of adrenalin and cocain. As seen from recent accounts, some Indian surgeons in large practice are now instilling these drops for periods up to one hour (!) before operating. Their experience should be valuable in this respect. The only two cases in my own practice

with any possible bearing on the point are the following: 1. Several months ago an expulsive haemorrhage occurred three or four hours after operation. 2. There is a patient now in hospital who presumably had a smaller fundus haemorrhage six hours after operation. Pain was experienced then after coughing, and next day the wound was found pressed open by an extensive prolapse of vitreous (hyaloid unruptured) and of iris.

These are the only cases of expulsive or partly expulsive haemorrhage which have occurred recently in the Karachi hospital, and it seems possibly more than a coincidence that neither took place at the more usual time—during operation. Vascular dilatation in the reaction period after our operations may be often considerable, and in both these cases eserin had been used freely after operation, possibly increasing the vascular reaction. But even if experience should eventually show an increased tendency to destructive haemorrhage after operation when prolonged cocain instillation has been practised, this may be balanced by diminished frequency of the accident during operation, when the risk of it is ordinarily greatest. The unusual degree of constriction of the vessels at this time under full cocainization may have this effect. And lowering of tension before operation by the adrenalin and cocain may also lessen the risk of haemorrhage, which, when it occurs, ordinarily accompanies the sudden loss of tension due to the making of the incision. That such preliminary reduction of tension may be considerable is indicated by the frequency with which cupping or folding of the cornea is seen at the close of the operation in fully cocainized eyes. Rarely there is some slight tendency to folding of the sclera also.

Thus the possibility of ill-effects from our sometimes over-free use of cocain must be regarded as decidedly problematic. On the other hand, the advantages derived from the frequently attained complete anaesthesia have been very convincing. Undoubtedly we must have been spared a number of accidents and complications attributable to "squeezing" of the orbicularis during operation. To emphasize this point there has been one complete loss of vision in an imperfectly anaesthetized eye, from large loss of vitreous due to "squeezing"; and in another case a low-grade infection from fouling of the knife by the lid-margin, also due to contraction of the orbicularis. The reduction of ocular tension before operation must also tend somewhat to lessen the risk of vitreous escape during and after expulsion of the lens. And the dilatation of the pupil facilitates expulsion of the lens, thus enabling a large number of simple extractions to be performed with the minimum of stretching of the iris, and so reducing the risk of prolapse.

The effective use of eserin after simple extraction.—I have been endeavouring to settle the question whether, by the fullest use of eserin, anything approaching absolute security from risk of iris

prolapse is obtainable after simple extraction. The value of a normal pupil is particularly great in the glare of India; and in eyes rolled more or less upwards after an upper section has been made, much trouble may at times be avoided by dispensing with an iridectomy.

An order was issued to the assistants quite a year ago that no eye was to be bandaged up after simple extraction until the pupil was well contracted. But owing to constant changes in the personnel, the records have been very imperfectly kept, and there are no exact figures of the number of simple extractions performed. However, the enquiry has been far from barren, encouraging a freer resort to the simple method, and opening up at least one side issue. A strict record is now being kept, from which figures may be found worthy of publication later.

The carrying out of the order, as issued, has not always been found practicable. Symptoms of slight poisoning have appeared in three patients lately, with the pupil still above or about the normal size. The patients have complained of pain in the epigastrium, with faintness and nausea, and have vomited. The eserin drops, 1 per cent., have generally been instilled at two wide intervals, between the successive operations on batches of patients. The better way, probably, is to instil five or six times at about one-minute intervals immediately after operation, and to add more, if found necessary, half an hour or so later. For in Bombay years ago we found that three or four instillations at one-minute intervals generally resulted in satisfactory miosis next day.

The influence in this connection of the adrenalin instilled before operation is not quite simple. In Bombay, the medicament was always at that time used once only, before the cocain instillations, and we were convinced that the contraction of the pupil produced (next day) wasmuch more constant and marked than in earlier days when no adrenalin was used. When adrenalin was not used there was so much conjunctival irritation from the preliminary maximal perchloride irrigation that the eserin drops instilled after operation could be seen largely to be washed away in tears. The adrenalin by preventing or limiting the secretion of tears, evidently assisted in the local absorption of the eserin, thus indirectly overcoming the mydriasis which, in combination with the cocain, it had produced. But in those days there was only the moderate enlargement of pupil produced by one instillation of adrenalin and four of cocain to be overcome. The symptoms of poisoning in the three instances mentioned came on after 8, 9, and "about 20" (!!) instillations of eserin. They were quite transient in each case. In the first case a hypodermic injection of morphia gave quick relief. In the others nothing was administered.

The first case of poisoning, in which eserin was instilled about

twenty times, was a little alarming. Besides presenting the most resistent pupil, it was exceptional in other ways. Adrenalin had been used three times before operation, and the separation of the lids after operation, on gentle closure, was the widest I have seen. The lids were quite 4 mm. apart. The earlier eserin instillations were made simply by depressing the lower lid, and probably very little of the solution found its way under the practically motionless upper lid. Later, however, the assistant moved the upper lid at each instillation to assist diffusion, and then kept it in place with a moistened cotton-wool pad. The instillations were continued every 5-10 minutes for 2½ hours, until stopped by the general symptoms already mentioned. The pupil was still above the normal size. It evidently contracted later, but too late to prevent an incarceration of the base of the iris in the wound, for next day a narrow slit-like pupil was found reaching to the upper margin of the cornea. In the two other cases of (slight) poisoning, also, the drops were stopped with the pupils perhaps slightly above the normal size, but the next day both pupils were quite small.

Our difficulties have been increased by local conditions. The state of the Indian conjunctiva has necessitated very free perchloride irrigation (2 to 3 minutes with 1 in 3,000 solution), and this, together with the feeble mental control of the patients, has necessitated a freer use of adrenalin and cocain than would ordinarily be required in Europe. Hence the time and trouble taken in overcoming a wider mydriasis than would commonly be encountered elsewhere.

Thus, according to present evidence, while one instillation of adrenalin, with a moderate use of cocain, has the curious effect, apparently, of assisting in the production of miosis later, a freer use of these drops may have the opposite effect, retarding the action of eserin, as one would expect.

To return to the main question of the attainment of practical security from risk of iris prolapse, it is encouraging that as yet the answer is not definitely negative. In the early days of the enquiry there were two definite prolapses, but they were in the only two eyes in which the pupil was left distorted and displaced at the close of the operation. There is no record of the number of eserin instillations used or of the state of the pupils afterwards. It is too much to expect that eserin should pull such pupils into place, and the enquiry is thus narrowed to uninjured irides, with round and more or less central pupils. There have been two incarcerations of the base of the iris in the wound. One has been already referred to above. It is not surprising that the imperfect action of eserin, described in this case, should have failed to keep the iris in position. But the continued instillation of 1 per cent. eserin solution four times each morning and evening not only prevented the incarceration from enlarging into a prolapse, but actually pulled the iris back

somewhat, so that the patient was discharged with a pupil only moderately displaced and V. of $\frac{6}{6}$ partly with + 10 D. sph. ⌒ + 3·5 D. cyl. In the other case there was no excuse of imperfect action of eserin. Next day the pupil was found small, but elongated and somewhat displaced up. Eserin drops were continued only three times a day, for an insufficient period. As a result iris became visible at the surface of the globe a fortnight later, with a barely perceptible elevation at one point.

In conclusion, it is only fair to recall and to utilize one of the Sindhi's good points. He makes a more intelligent hospital patient than the average elsewhere in India. Thus he appreciates the best possible result, with the least possible risk, and to obtain this he does not object to a fairly prolonged after-treatment, including "needling" when necessary. Hence, in the new Karachi Eye Hospital, opened this year, the material is at hand wherewith to demonstrate to a sufficiently critical public the superiority of the more established methods over the intra-capsular extraction now so widely practised in Northern India. There are two essentials in any such attempt. (1) A fair number of supplementary needlings must be performed; and (2) the safety afforded by maximal perchloride irrigation must be utilized always, both in the primary and in the secondary operation. Of great assistance also in this endeavour will be the extended practice of simple extraction, which seems possible if the promise shown above, by the judicious use of adrenalin, of cocain, and of eserin, is substantiated.

INJURY TO THE EYE FROM SPECTACLE GLASS

BY

D. V. GIRI, D.O. (Oxon.),

EASTBOURNE.

Cases

CASE I.—On August 8, 1916, R—— K——, aged 62 years, came to the hospital with the history that three days previously, while chopping wood, a piece flew up and hit his right glass, which broke and pierced the eye.

On examination, I found: R.E. ecchymosis just below the lower lid. Subconjunctival haemorrhage below the limbus corneae and between it and the internal canthus. Perforating wound of the cornea in the lower inner quadrant. Behind the perforation, where probably the iris is adherent, a small clot of blood in the anterior chamber, which is very shallow. Iris somewhat bulged forward. Pupil semi-dilated and inactive. T—. The fundus, the details of which became visible only with the help of the strongly luminous

electric ophthalmoscope, shows posterior staphyloma and other changes characteristic of high myopia. No sign of infection of the wound.

L.E. also myopic.

Ung. hydrarg. oxid. flav. c. atropin sulph. and boric fomentations three times a day and a padded shade to be tied on the eye, so as to keep it closed, were prescribed.

The following are my notes on his subsequent visits :—

August 9, 1916.—Pupil still semi-dilated. No sign of infection of the wound. The patient says he had a very good night and that " the eye feels a lot easier."

August 14, 1916.—The wound continues free from infection. Reaction no more than the repair of the wound would explain, Some signs of the wound getting vascularized. A faint streak of blood on the lens—the remains of the clot noted on the first visit. Pupil semi-dilated. Pupillary margin appears free.

August 18 and 22, 1916.—Further improvement noted.

August 29, 1916.—The surface of the wound has become infected. The eye cocainized and the wound cauterized with the electric cautery.

September 15, 1916.—Pupil well dilated. Ulcer healing slowly.

September 29, 1916.—Ulcer healed. The unevenness not yet repaired. Eye quiet.

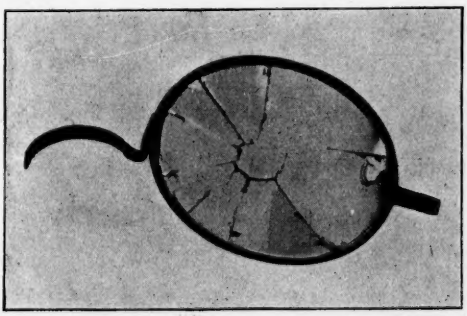
CASE II.—This is a case which came under the observation of Mr. A. Zorab in 1913. According to his notes, on the evening of 30th December of that year, E—— E——, aged 39, another high myope, came to the hospital complaining that a couple of hours previously, not having been able to see well in the dark, she had jammed her left eyeglass against the edge of a half-open door and hurt her eye. This was again a perforating injury with a linear opening at the limbus through which the iris had prolapsed. The patient was admitted into the hospital, the prolapsed iris excised, and the eye put on the same local treatment as in the previous case. The next day the anterior chamber was found re-formed and the cornea and aqueous were clear. On the third day a bead of vitreous was noticed to protrude from the wound and was excised. Because of her having had at intervals attacks of severe pain in the eye, suspicion of the likelihood of a piece of glass being present in the eye and pressing on the ciliary body occurred, and the eye was X-rayed. The skiagram was negative. The patient was later discharged from the hospital with the eye perfectly quiet. She has been seen since and the eye has remained quiet.

Remarks

The foregoing add to the list of similar cases published by Hans Lauber, Sydney Stephenson, Casey A. Wood, and others, referred

to in the "Notes and Echoes" column of the *Ophthalmoscope* for October, 1916.

Some of the interesting conclusions arrived at by F. B. Vreeland, who made a communication on the subject of injuries of the eye from broken spectacle glass to the Chicago Ophthalmological Society recently, derive support from the cases described above. That injuries from broken glasses are very rarely serious is probably because the force with which the broken piece impinges on the globe is hardly ever sufficient to permit of its injuring the lens, or travelling further and lodging in the vitreous. Perhaps perforation of the cornea, as in the instances under consideration, is as severe an injury as could occur, and the exemption of the wound from infection, as noted in the first patient, although he came under treatment three days after the accident, seems to point to the probability that owing to its smooth and polished surface and the general absence of dirt on it because of the necessity of cleaning it and keeping it clean, the spectacle lens does not harbour microbes, at any rate of the pathogenic kind, and is hence non-infective. In speaking of surgical instruments, Haab says that it has been proved that a well-polished instrument may be rendered germ-free or nearly so by simple mechanical rubbing ("Atlas and Epitome of Operative Ophthalmology," by O. Haab, of Zurich—authorized translation from the German, edited by G. E. de Schweinitz, of Philadelphia. P. 77, 1910). I need hardly point out that an optical lens such as is used for spectacles is as highly polished and smooth an instrument as one could think of.



That *minus* lenses are more dangerous than *plus* ones appears to me to be due in the main to mechanical reasons. The concave lens is thinnest at the centre and gradually thickens centrifugally until it attains its maximum thickness at the periphery. The converse holds good of the convex lens. An impact on the rim of a concave lens strong enough to break it at its thickest part would obviously

not leave the thin centre intact—because glass is highly elastic and brittle—and the piece that is smashed in, being thinnest at the centre, presents the sharp, more or less pointed end of the wedge it forms to the globe, and if the impetus is sufficient, easily perforates it. A much weaker impact on the central area would be sufficient to smash this part of the lens and drive small, thin, sharp fragments towards the globe. These mechanical considerations apply with special force to the higher *minus* lenses. The coming of the impact from in front, the resistance of the metal rim in the case of rimmed spectacles or of the metal catch in the case of the rimless ones to the backward motion of the thick peripheral edge, appear to determine the impinging of the thin sharp end of the wedge on the globe. The *plus* lens, because of its convex surface, does not in the first instance receive an impact very well. The striking body gets deflected in its course and dissipated in its force, just like a bullet striking a steel helmet. The blow is most likely to fall on its most prominent central part which is the thickest. Especially in the case of the higher *plus* lenses, unless the blow is strong enough independently to cause severe injury to the face or head, it is not likely to do anything more than at most crack the lens. In the case of a blow of such severity, the resulting damage of the face or eye would probably not be worse on account of the intervention of the lens. Even in a hypothetical case where, owing to an unapparent flaw in the glass, the lens gets smashed in by a comparatively weak blow, owing to the thickness of the impinging piece, it is unlikely that there would be anything more serious than a contusion or abrasion of some part of the eye. This contrast between the two kinds of lenses gets less and less as one goes down from the higher to the lower ones, although the balance always remains in favour of the *plus* lens.

Further, that these accidents are not confined to industrial occupations, but occur quite often in the course of athletic or domestic pursuits is evidenced by the fact that in Case I the eye was injured from broken spectacle glass because of a piece of wood hitting it while the patient was chopping firewood, and in Case II, because of the patient jamming her left spectacle glass against the edge of a half-open door in the dark.

My thanks are due to Mr. Arthur Zorab, Surgeon to the Southampton Free Eye Hospital, for permission to publish the cases.

Since sending the above communication for publication I have had two cases which lend support to my interpretation of spectacle injuries.

The spectacles figured belong to a messenger boy.* While he was running an errand, he happened to pass through a street where

*The spectacles were exhibited at the Oxford Ophthalmological Congress of last year.

there were some boys throwing stones at one another in play. One of the stones hit the left lens punching a hole in the middle and producing this interesting radiate fracture. It is a —7D. sph. It will be noticed that at its centre it is hardly 0.5 mm. in thickness.

The impact could not have been very strong, as is evidenced by the retention of the fractured fragments in position in the frame and by the absence of any damage to the eye of the boy.

The next case is one of a man who, while watching a boat under repair at the Southampton Docks, had a bolt fly from the boat and strike his spectacles. The left lens was shivered to fine bits. He came in a hurry to the hospital fearing that something serious had happened to his left eye. All the injury he had sustained was a slight peripheral abrasion of the cornea. At the outer canthus and among the lashes there were a few fine flakes of glass which could easily pass for bits of broken cover slips such as are used in bacteriological microscopy.

The patient was a myope wearing —4 D. spheres.

A NEW HETEROPHORIA TEST

BY

A. R. BRAILEY,

LONDON.

THIS simple apparatus was devised for the detection and estimation of heterophoria in candidates for the Royal Air Force. In use it has proved so rapid and efficacious that I think it may well supplant the Maddox rod in ordinary practice. In principle it depends on the old red and green letter test for binocular vision. Illuminated green letters are seen by one eye through a green glass, a red spot is seen by the other eye through a red glass. The letters are disposed in two rows, one above the other, and are placed so that the vertical limb of each letter in either row is at a distance, the one from the other, of the tangent of two degrees at six metres. Circular spots on the vertical limbs of each letter are at a distance of the tangent of half a degree from each other; on the horizontal limbs the distance of the tangent is one degree. The red spot, by a simple shutter, can be shifted to either of two positions. The position of the red spot as described by the patient in relation to the letters, at once denotes the presence, variety, and degree of heterophoria.

The advantages over the Maddox rod are:

1. That the amount of heterophoria is determined at once.
2. That by means of a rotating prism it is easy in a moment to see what correction is necessary to restore perfect muscle balance.

3. That by shifting the position of the red spot the range of the scale is increased, and it is impossible for the patient to know what its position should be in relation to the letters.

4. That patients with any degree of binocular vision at all apparently find no difficulty in seeing the spot and the letters. With the Maddox rod, it is often very difficult to get them to see both the light and the streak.

It is not necessary that the test should be carried out in a dark room, but the light must not be sufficient for the patient to see more than the red spot with the one eye, or the results are vitiated by the fusion sense. The apparatus can be obtained from Messrs. C. W. Dixey & Son, 3, New Bond Street, London.

A CASE OF AN EYELASH PERFORATING THE CORNEA AND ANTERIOR LENS CAPSULE

BY

R. GRAHAM BROWN,

BRISBANE.

No. 7363 Pte. A. C——, 1st Wiltshire Reg., aged 26 years. This patient was seen by me on September 26, 1914, at No. 3 General Hospital at St. Nazaire. He had been shot through the left lower jaw on the 20th September. (My notes do not give more details on this point. I am, however, almost sure that the wound entrance was inside the mandible below, and the exit on the cheek just below the left lower lid). The patient stated that he suffered no pain in the eye until about two minutes after the wound when "the eye felt as if it was burning all over." He was told that it was blistered. The same night he had swelling of the eyelids. Until seen by me (six days after he was wounded) no treatment of the eye condition had been carried out. I found that there was a great deal of chemosis, which almost covered the whole of the cornea. There was no purulent discharge. The tension was not increased, and there was no ciliary tenderness. An anaesthetic was given to allow of a complete examination of the cornea. A deeply infiltrated area of about 2 mm. in diameter was discovered at about 6 o'clock, and 1 to 1½ mm. from the limbus. On gently probing the infiltrated area, which was, by the way, sodden on the surface, a small black foreign body was seen. On seizing this with a pair of iris forceps and applying traction, an eyelash was withdrawn. This surprised us not a little. My notes say, "Eyelash 4 mm. long—? from the lower lid." The iris was clear and not contracted, and the lash had penetrated the lens capsule. Atropin was instilled; and fomentations were applied to the orbital region.

On the next day the pupil was three-quarters dilated, and the chemosis was rapidly disappearing. On the 29th (two days after anaesthetic) there appeared early signs of traumatic cataract, with a slight increase in tension. The next day a small amount of lens matter was protruding into the anterior chamber. On October 2 the eye was almost quiet, and the pupil was fully dilated. On the 5th the traumatic cataract was stationary. The following day the patient was shipped to England with notes and a supply of atropin drops. I was later informed that the eye had been excised in England on October 12, 1914.

It is to be regretted that fuller notes were not taken nor an X-ray examination made. Pressure of work at that period is, I think, sufficient excuse. I am of opinion that there was no foreign body in the eye and that the eye was excised in the fear of sympathetic affection in the other eye. This procedure occurred, I fear, on more than one occasion in the early days of the war. I can find no notes referring to the state of the light projection, although perception was present when the patient left my care.

PHLYCTENULAR CONJUNCTIVITIS AND ADENOIDS

BY

GEORGE MILNE, M.D., D.P.H.,

CAPTAIN R.A.M.C.

LATE CHIEF CLINICAL ASSISTANT MOORFIELDS EYE HOSPITAL

THE following two cases are of interest in connection with Captain Hird's article on "Phlyctenular disease and its relation to Tuberculosis," in the April number of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

CASE 1.—W. G., a boy, 4 years old, was brought to me by his mother, who stated that he had been in his present condition for the last eighteen months. He had been at irregular intervals attending the out-patient department of more than one London Hospital without any apparent relief. He had intense photophobia and blepharospasm, much injection of his conjunctivae, and typical raised phlyctens in both eyes. Atropin ointment was ordered and a week later his refraction was estimated showing low hypermetropia and astigmatism (about 1 D.). Correcting glasses were ordered to be worn constantly. Syr. ferri iodidi was given internally and weak yellow ointment locally, and the mother was advised to keep the boy out of doors as much as possible. At the end of a month there was no appreciable improvement.

The boy then had an attack of acute follicular tonsillitis. This

left him with enlarged tonsils and cervical glands, and, what I had not noticed before, definite symptoms of adenoids.

I advised the removal of the tonsils and adenoids. This was done six weeks after his attack of tonsillitis. His tonsils were guillotined and the adenoids thoroughly removed; all this time there had been no change in his eye condition.

The morning after the operation, to everybody's surprise, he was sitting up at the window looking at his picture books with no trace of photophobia, blepharospasm, or lacrymation, and no abnormal injection of his conjunctivae. The phlyctens had not quite disappeared, but within three days nothing abnormal, apart from some faint corneal scarring, could be detected. His eyes have remained perfectly well now for a year. I have seen him running about without his glasses.

CASE 2.—K. Mc., aged 11 years, had been under treatment for fifteen months for headache, photophobia, and lacrymation. One pair of glasses had been prescribed for her at hospital six months ago without any relief. On examination she had well-marked phlyctens on her left bulbar conjunctiva. Under atropin I found her to have hypermetropia in both eyes with astigmatism also in the left eye. Her glasses were correct. She had enlarged tonsils, enlarged cervical glands, and nasal catarrh. Her mother said she slept with her mouth open and snored. I ordered general tonic treatment, stopped school and all near work for the eyes, and tried the usual local remedies without any improvement at the end of two months. I stopped all treatment and a fortnight later removed her tonsils (guillotined) and adenoids. In less than three weeks the eye condition had cleared up entirely. I saw her after three months' stay at Margate; the glands in the neck persist and are undoubtedly now tubercular. Her eyes gave no further trouble. This case was still under treatment when I joined the R.A.M.C.

Remarks.—I am quite convinced that the removal of the adenoids and tonsils was the cause of the rapid recovery of the eye condition in both cases.

The conjunctiva, cornea, and posterior nares are dependent on the fifth cranial nerve for sensation. The presence of adenoids and the associated naso-pharyngeal catarrh was apparently reflexly responsible for the intense photophobia and lacrymation in Case 1. The difference in the clinical picture the day after the operation was remarkable. In this case all treatment for the eyes had been suspended when the boy had his attack of tonsillitis, and in Case 2 it was stopped so as to note the effect of the operation on the eye condition. Sixty-three per cent. of Captain Hird's cases had enlarged cervical glands, the majority of which he regarded as tubercular, and the others as due to infection through the teeth.

My experience, during three years' medical inspection of school

children, was that over eighty per cent. of all cases with enlarged cervical glands in children had definite signs of adenoids. The mothers attributed the glands to various causes, viz., "sore throats," tonsillitis, repeated colds in the head, after-effects of measles or scarlet fever. They also gave a history of earache, deafness, discharge from ears or nasal catarrh. The presence of adenoids was confirmed by palpating the nasal pharynx. The tonsils were in most cases hypertrophied. This condition, if untreated, forms a suitable soil on which the tubercle bacillus may become implanted; the cervical glands, bronchial glands, and eventually the lungs may become involved; the child may get an attack of phlyctenular conjunctivitis.

Tuberculosis is recognized by ophthalmic surgeons as an important factor in the causation of phlyctenular conjunctivitis. In Case 2 the phlyctens cleared up completely without any improvement in the glandular enlargement, in fact the tubercular process progressed. Had the adenoids been removed earlier, one felt that both the tubercular glands and the phlyctenular conjunctivitis might have been prevented. My reason for publishing these cases is to draw attention to the necessity for careful examination of the throat in all cases of phlyctenular conjunctivitis, and to advocate the early removal of the adenoids, which I consider an important step in the prevention of tubercular cervical adenitis as well as an effective means of treating and preventing the recurrence of phlyctenular conjunctivitis in cases which resist the ordinary methods of treatment.

COUNCIL OF BRITISH OPHTHALMOLOGISTS

Report on the teaching and examination of medical students in ophthalmology

THE Council have considered the question of the teaching and examination in Ophthalmology before qualification, and report as follows:

PART I.—Representations to the General Medical Council on the subject.

PART II.—Existing regulations concerning the teaching and examination in ophthalmology in the United Kingdom and abroad.

PART III.—The need for improved instruction of medical students in ophthalmology.

PART IV.—Summary of recommendations.

Part I.—Representations to the General Medical Council on the Subject.

By the courtesy of the General Medical Council the following information has been obtained.

In 1879, twenty-four prominent ophthalmic surgeons presented a petition to the General Medical Council advising a compulsory three months' course in practical ophthalmology for medical students, and pointing out to the Council the neglect of training in this subject as compared with Continental and Indian Universities. As the result of this petition the General Medical Council approached the various examining bodies in the United Kingdom, and subsequently made the following recommendation:

"With reference to ophthalmology, the opinion of the bodies is almost unanimous that, under the present arrangements of their respective examinations, the subject of Ophthalmology receives its fair share of attention, and that it would not be desirable, either to require attendance on a special course of lectures on Ophthalmology as part of the curriculum for a medical student, or to make ophthalmic surgery a distinct subject of examination (separate from surgery) at the Pass Examination for a Licence to practise. The Committee* see no reason to dissent from that opinion of the Licensing Bodies, and they accordingly do not advise the Council to recommend that a special course of study of Ophthalmology, or a distinct examination in that subject, should be required."

On May 29, 1891, the Ophthalmological Society of the United Kingdom† presented a memorial to the General Medical Council in favour of including ophthalmic medicine and surgery in the ordinary curriculum. This was received by the Council, and entered on their minutes, but no further action was taken at the time.

On May 26, 1906, the General Medical Council approved a report of their Examination Committee that: "The Inspectors called attention to the circumstance that at some Boards no evidence of knowledge of ophthalmology was required."

On Nov. 26, 1910, the General Medical Council adopted a report of their Education Committee as follows:

"In the curriculum of all the licensing bodies, with three exceptions, special courses on Ophthalmology form an essential part. The Committee are of opinion that every student of medicine should receive some special instruction in the subject. The Committee do not think it necessary to insist that every student should be examined in ophthalmology, but they are of opinion, that all students should be liable to be examined in some branch of the subject."

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*i.e., The Education Committee of the General Medical Council.

†*Trans. Oph. Soc.* U.K., Vol. XII, 1892, p. 225.

In 1911, a communication from the British Medical Association asking that the study of ophthalmology should be made compulsory in the medical curriculum, was brought before the General Medical Council. In reply the attention of the British Medical Association was called to the report by the Education Committee in November, 1910, cited above.

Part II.—Existing Regulations concerning the Teaching and Examination in Ophthalmology in the United Kingdom and abroad.

The present condition of Ophthalmic Training and Examination in Great Britain and Abroad.

A circular letter was sent to the principal universities and other examining bodies at home and among the allied and neutral countries. In consequence of the war, the circular probably failed to reach some of those to whom it was addressed.

Answers have been received from 22 examining bodies in Great Britain and Ireland and from 26 colonial and foreign universities.

A. The Teaching and Examination in Obhthalmology in the United Kingdom.

(1) The requirements as to training are as follows:

a. No certificate of training in ophthalmology required.

University of Oxford.
University of Cambridge.

b. Ophthalmology one of four optional special subjects, certificates required for two only.

The Society of Apothecaries of London.

c. A certificate of attendance at an ophthalmic clinic for three months required.

University of London.
„ „ Liverpool.
„ „ Aberdeen.
„ „ Dublin. Trinity College.
Queen's University of Belfast.
Conjoint Board R.C.S. England and R.C.P London.
„ „ R.C.P. and S. Edinburgh and R.F.P. and S. Glasgow (13 attendances).
„ „ R.C.P. and S. Ireland.

d. Certificates of attendance on a course of lectures and clinical instruction required.

University of Edinburgh.
„ „ Glasgow.
„ „ St. Andrews.
„ „ Wales.

University of Durham.
" " Birmingham.
" " Manchester.
" " Sheffield.
" " Bristol.
" " Leeds.
National University of Ireland.

(2) The methods of examination are as follows:

a. An occasional question in the surgery paper, or *viva voce*; the examiners not being ophthalmic surgeons.

University of Oxford.
" " Cambridge.
" " London.
" " Durham.
" " Leeds.
" " Sheffield.
" " Bristol.
" " Glasgow.
" " Aberdeen.
" " Wales.
Conjoint Exam. Board R.C.S. England and R.C.P. London.
" " " R.C.P. and S. Edinburgh and R.F.P.S. Glasgow.
Society of Apothecaries of London.

b. Special examination conducted by ophthalmic surgeons as part of the qualifying examination.

University of Dublin, Trinity College.
National University of Ireland.
Queen's University of Belfast.
Royal Coll. of Phys. and Surg. Ireland.
University of Liverpool.
" " Birmingham.
" " Manchester.

c. Class examinations. The certificates required before admission to the qualifying examination given only to students who attend a recognized course regularly and reach a defined standard in the class examinations.

University of Edinburgh.
" " St. Andrews. (Commencing 1919).

(The regulations under (*a*) also apply to these two Universities.)

B. The Teaching and Examination in Ophthalmology in Colonial and Foreign Universities.

America. The report of the Carnegie Trust on Medical Education in America has been of great assistance to the Council in selecting the Universities to which circulars should be sent.

United States.

University of Michigan, Ann Arbor.
Johns Hopkins University, Baltimore.
Harvard University, Boston.
North Western University, Chicago.
University of Illinois, Chicago.
Rush Medical College, University of Chicago.
Western Reserve University, Cleveland.
University of Kentucky, Louisville.
" " and Bellevue Medical College, New York.
" " Columbia, New York.
" " Cornell, New York.
Yale University.

Canada.

McGill University, Montreal,
University of Toronto.

All the above, with the exception of the North Western University, Chicago, require students to attend both a course of lectures and a course of clinical instruction, and hold special examinations conducted by ophthalmic surgeons. The North Western University, Chicago, requires a certificate of attendance on a course of clinical instruction in ophthalmology and there is no special examination.

France.

University of Paris.
Clinical course in fourth year. Certificate after examination.
University of Toulouse.
Clinical course of one term. Ophthalmology alternates with dermatology as a special subject in the qualifying examination.
University of Lyons.
Clinical course of one term.
University of Montpellier.
No certificates required.

Switzerland.

The State examination for a Diploma to practise medicine includes an oral and practical examination in ophthalmology conducted by two ophthalmic surgeons.

University of Basle.
A course of lectures during two terms and a clinical course of three terms.
University of Lausanne.
Clinical course of one term.

Spain.

Central University of Madrid.
Course of 82 lectures and clinical attendance from October to May. Examination at the end of the course conducted by the Professor of Ophthalmology.

University of Barcelona.
Course of 68 lectures; otherwise exactly as Madrid.
Sweden.
The examination in ophthalmology is entirely practical and oral, and is conducted by the Professor.
University of Upsala.
A course of lectures and two months clinical course.
Norway.
Viva-voce examination as in Sweden.
University of Christiana.
Clinical course of one term.
Denmark.
University of Copenhagen.
Clinical course twice weekly during one term.
Occasional question in the surgery paper in the qualifying examination.
Japan.
University of Kyoto.
A course of lectures and a clinical course.
The examination in ophthalmology is oral and is conducted by ophthalmic surgeons.

The above analysis shows that Great Britain stands almost alone in granting diplomas to practise medicine without evidence of an adequate knowledge of diseases of the eye. There are still three examining bodies which have not even adopted the recommendation of the General Medical Council of 1891, which requires a certificate of attendance at a three months clinical course. Moreover, at other institutions the interpretation of what is meant by a three months course varies greatly and should be more accurately defined, as it is by all the American Universities.

In Great Britain only a small minority of the licensing bodies apply regularly a test of ophthalmic knowledge. In Ireland and in the great majority of Foreign Universities, Ophthalmology is one of the subjects of the qualifying examinations and the examiners are invariably ophthalmic surgeons.

Part III.—The Need for Improved Instruction of Medical Students in Ophthalmology

In the opinion of the Council the knowledge of ophthalmology possessed by the majority of medical students in Great Britain at the time of their qualification is inadequate to enable them to diagnose and treat efficiently cases of ordinary eye diseases met with in general practice. In 1917, Sir Arthur Downes in the Report of the Departmental Committee of the Local Government

Board on the Welfare of the Blind (p. 60) quoted, and endorsed as still applicable, the statement made in the memorial presented by the Ophthalmological Society of the United Kingdom to the General Medical Council, in 1891, that "it is notorious that the general body of the profession does not possess a competent knowledge of diseases of the eye." Unless further action is taken in the matter this reproach to the medical profession will continue.

The Council hold that it is desirable that the training in ophthalmology should be mainly clinical, and they agree that a period of three months is all that can be allotted to the subject in a five years curriculum. They, therefore, recommend: (1) that attendance at an ophthalmic clinic for not less than six hours a week during a period of three months shall be required of every student; (2) that such a period of clinical training shall be supplemented by a course of systematic lectures or clinical classes.

A very serious defect in the existing regulations is the absence of any test of the student's knowledge of ophthalmology in the qualifying examinations. Teachers in the medical schools are well aware that without the stimulus of an examination many students give the least possible attention to ophthalmology and may, and often do, finish their training without gaining even a rudimentary knowledge of the subject. In the opinion of the Council, it is most desirable that an examination in ophthalmology should be made an integral part of the qualifying examination by all those licensing bodies which have not hitherto included it in their schedule.

Internal Students. When an examining Board deals only with students trained within its own walls the system adopted by the Universities of Edinburgh and St. Andrews has the advantage of not adding to the burden of the qualifying examination. At the end of the course in ophthalmology there is a written and a practical examination, and certificates of admission to the qualifying examination are not granted to students unless they have attended the course regularly and have reached a definite standard in the class examinations.

The Council are of opinion that in such examinations, as in those for qualification, a second examiner should be associated with the teacher.

External Students. A different problem confronts such examining Boards as the Universities of Oxford, Cambridge, and London, and the Conjoint Boards, which have to deal with students trained under diverse conditions in Institutions over which the Boards exercise little supervision. Such bodies should require definite evidence of regular attendance at an ophthalmic clinic and at a course of systematic instruction. In addition they should have a test that

the student has acquired an adequate knowledge of the subject. The Council do not consider it essential that this test should be by a written examination, but they hold that there should always be a practical and oral examination in the diagnosis and treatment of the commoner diseases of the eye and in the use of the ophthalmoscope. Such an examination can only be carried out efficiently by ophthalmic surgeons who should also set and adjudicate on such ophthalmic questions as may be given in papers.

In the examination in ophthalmology, as in the examinations in pathology, surgical anatomy, etc., a candidate who does not attain to the required standard must be held to have failed to qualify in surgery.

Part IV.—Summary of Recommendations

The Council therefore make the following recommendations:

(1) No student shall be admitted to the final examination, qualifying to practise medicine, unless he has attended an ophthalmic clinic for not less than six hours a week during a period of three months, and has attended a course of systematic instruction in ophthalmology.

(2) No student shall be considered to have passed the qualifying examination unless he has shown a sound knowledge of practical ophthalmology in an examination conducted by ophthalmic surgeons.

ANNOTATIONS

Ophthalmology in the Medical Curriculum

Our contemporary, the *Edinburgh Medical Journal*, has recently (January, 1919) published a series of papers dealing with the teaching of ophthalmology to medical students. Mr. E. Treacher Collins and Drs. Freeland Fergus, W. G. Sym, and J. V. Paterson contribute to the symposium. While there is a broad agreement that ophthalmology should be taught to students, there is naturally some divergence of view as to the detail among the writers. Collins thinks that for purposes of general diagnosis the ophthalmoscope is in its way as valuable as the stethoscope, in the use of which every student is carefully trained. The rising generation of practitioners should be competent to recognize and to treat many of the commoner diseases of the eye, especially ophthalmia neonatorum and acute glaucoma. The study of ophthalmology affords an excellent training in accuracy of observation, and on that

ground alone should be taught. Collins is in favour of practical demonstration in preferance to systematic lectures, for, as he aptly says. "the reading of a good text-book is often preferable to listening to a bad lecture." He looks upon any attempt to teach students, as a body, how to correct errors of refraction as "a hopeless waste of time." Collins strongly advocates that an examination in ophthalmology, conducted by a competent examiner, should be made part of the final examination.

Fergus regards any attempt to overload the twenty sittings at present devoted to ophthalmology in Glasgow as likely to prove disastrous. A teacher should endeavour to instruct a pupil in those parts of the subject which are essential to every practitioner. The courses should be entirely clinical. The student should learn the signs and symptoms of the more important diseases of the eye, and, as far as practicable, those which are symptomatic of general disease. Fergus would insist upon a man being able to use the ophthalmoscope almost with the same facility as he employs a clinical thermometer. The important point is that he should be in a position to use the ophthalmoscope as an instrument of medical research rather than of ophthalmic investigation. No attempt should be made to endeavour to convert the student into an expert refractionist. A mere indication of the methods employed only should be given. Fergus attaches importance to instruction in diplopia, in the development of squint, in the pupillary reflexes, in the visual acuteness, and in the use of the perimeter.

Syms regards a course of twenty-four lectures and demonstrations, with some tutorial instruction in the use of the ophthalmoscope, as neither too long nor too short. The intimate manipulation of the ophthalmoscope should be postponed until after graduation. No teaching can be satisfactory unless the student is subject to examination.

Paterson thinks that medical students should be taught to recognize the commoner eye ailments, and that teaching should be mainly clinical. He lays considerable stress (as does Fergus) upon the future practitioner familiarizing himself with injuries of the eye, in connection with which the teacher should take up the question of visual efficiency in workmen. On the other hand, great attention need not be paid to the differential diagnosis of the various muscular palsies. Minor operations should be demonstrated, but Paterson thinks it adequate in the case of the student if a few typical major operations on the eye were shown. These points, given plenty of material, can be compassed in about twenty-seven meetings of the class, which should be limited in number to forty at most. The use of the ophthalmoscope should be taught in tutorial classes, in which elementary lessons on errors of refraction, recording visual acuity, and the taking of the field of vision are also given. "No attempt

should be made to teach students how to prescribe glasses." Paterson does not advocate examination in ophthalmology. He would be content if students were made to realize that they could not be granted a class certificate unless they had a satisfactory knowledge of diseases of the eye.

Briefly, then, the writers of the articles noticed above agree that (1) ophthalmology should form an essential part of the students' curriculum; (2) no attempt should be made to treat the subject of refraction seriously; (3) the use of the ophthalmoscope should be obligatory; and (4) clinical demonstrations should be substituted for formal lectures.

An American School of Military Ophthalmology

With their usual foresight our American allies have instituted at Fort Oglethorpe, Ga., a school of military ophthalmology, which has been in working order since August, 1918. The underlying idea is to train eye men and others who have entered the service in military ophthalmology, more especially as it is practised overseas. Lieut.-Colonel G. E. de Schweinitz (*Amer. Jl. of Ophthal.*, December, 1918) has given an interesting account of the organization and development of the institution, which is in connection with U.S. General Hospital No. 14. A new building of two stories has been placed at the disposal of the school. The first floor includes refraction rooms, stalls for retinoscopy and ophthalmoscopy (in one of which a lantern screen can be readily adjusted), a room for the purposes of the optician, which also serves as a place for the clinical clerk to take the patient's history and record the preliminary visual tests, and a covered porch which, in suitable weather, is used as a waiting room. The first floor also contains a room for operations upon animals' eyes, a small theatre for such operations upon human eyes as do not call for the administration of a general anaesthetic, and rooms for the Chief of Service and the storing of records. The space still remaining is fitted as a ward of sixteen beds. The second floor of the building is occupied by beds (should such be needed), together with the usual offices connected with a sick ward. The operating theatre of the neighbouring Oto-Laryngological building is used for operations upon the eye which require a general anaesthetic. An entrance examination must be passed before an officer is admitted to the School of Ophthalmology. At the end of each four weeks' course the students are graded according to a report from the instructors after a written and oral examination. The Director of the School determines the degree of proficiency of each student, and it is upon this that the officer's ultimate retention for eye work in the Army is based. The staff of the School consists of

Major Meyer Wiener, as Director and Chief of Service, and of eight instructors, selected on account of their records as teachers and practical ophthalmic surgeons prior to entering the Medical Corps of the American Army. Material is obtained from several sources: (1) the regular dispensary service of U.S. General Hospital, No. 14, (2) patients from the eye ward of the same hospital, (3) recruits examined elsewhere, and (4) patients in the general medical, surgical, and neurological departments of the General Hospital. At the present time between 500 and 600 patients attend the School per month. The length of the course is four weeks, and it includes the teaching of refraction, muscle and other functional testing, anatomy and histology of the eye and its appendages, external diseases, ophthalmoscopy, operations, and ophthalmic neurology. Liberal use is made of the lantern, diagrams, freehand drawings, and microscopic slides. A feature of importance is the work done in co-operation with the other departments of the General Hospital, notably those of anatomy, surgery, oto-laryngology, X-rays, pathology, and bacteriology.

ABSTRACTS

I—INCONGRUENCE IN HEMIOPIA

Rönne (Copenhagen).—On incongruence and asymmetry in homonymous hemiopia. (Ueber die Inkongruenz und Asymmetrie im homonym hemianopischen Gesichtsfeld.) *Klin. Monatsbl. f. Augenheilk.*, April-May, 1915, p. 399.

Rönne's article deals with the interesting and difficult subject of the relationship of lesions of the optic paths to changes in the visual fields, especially in regard to the presence of incongruence in hemiopic fields.

It is generally accepted that corresponding retinal points are represented by "point centres" in close juxtaposition in one or other occipital lobe. Such an arrangement does not exclude the possibility of incongruence, and it is of great theoretical and practical interest to know in what circumstances we may expect it. Various types of incongruence may occur:

1. Incongruence due to errors of observation in perimetry. This may be avoided by using a series of test-objects.

2. True incongruence is present when the lesion is at a part of the optic path where the fibres from corresponding retinal points are not yet associated. This is more likely to be the case the further

forward the lesion is. Rönne believes that a pronounced incongruence in hemiopia indicates a lesion of the tract near its junction with the chiasma.

3. Owing to the normally greater extent of the temporal field, its outer part is not associated with any part of the nasal field of the other eye, but remains unpaired. Incongruence may thus exist in so far as the temporal defect in one field may be greater than the nasal defect in the other, to the extent of the unpaired portion of the former.

4. Incongruence may occur in respect of an upward divergence of the vertical margins of hemiopic fields. This symptom is not concerned with the arrangement of the nerve fibres, but with the fact that the hemianopic symmetrical plane does not fall exactly in line with the sagittal plane of the eyes.

5. According to Wilbrand, the cortical representation of corresponding points may be irregularly arranged, and thus incongruence in the fields may be produced.

6. The sparing of the macula or overflowing field (*überschüssiges Gesichtsfeld*) of Wilbrand is another form of incongruence. Rönne believes that this is due to a purely peripheral interweaving of the nerve-fibres in the retina. At the same time a difference in the two sides in this respect must in all probability be referred to an irregularity in the arrangement of the cortical representation.

Cases illustrating the various forms of incongruence are described, and numerous charts are given. Rönne concludes that individual irregularities in the arrangement of the nerve-fibre bundles may exist. Although this explanation may not be considered very satisfactory, he sees no other way out of the difficulty. The mixing of the fibres is in the great majority of cases extremely regular.

H. M. TRAQUAIR.

II.—THE PROPRIOCEPTIVE NERVE-SUPPLY OF THE EXTRINSIC OCULAR MUSCLES

Sherrington, C. S. (Oxford)—Observations on the sensual rôle of the proprioceptive nerve-supply of the extrinsic ocular muscles. *Brain*, November, 1918.

In this paper **Sherrington** adduces evidence in support of the view that the oculo-motor muscles possess a muscular sense, and that by virtue of this they must be considered to contribute in an important way towards orientation.

These muscles are copiously supplied with afferent nerve fibres; and this anatomical fact, taken along with certain physiological

phenomena to which he refers, appears to Sherrington clearly to suggest the rôle which the eye muscles play, in combination with the retinal images and the labyrinth, as well as, though to a minor degree, with the muscular sense of the neck muscles, providing for complete spatial orientation.

No reference is made to the bearing which pathological conditions of the eye muscles, and the frequently occurring deviations of the eyes, may be supposed to have on the subject. Even the important point of faulty physiological projection is not alluded to. His arguments will therefore, no doubt, appear more completely convincing to the physiologist than to the ophthalmic surgeon. Coming, however, as they do, from an authority of such eminence they deserve the fullest consideration on the part of ophthalmologists. But, as both anatomical and physiological data must be brought into accord with pathological and clinical phenomena, and not vice versa, it would certainly appear as if some modification of the author's views were necessary.

Admitting the existence of a so-called proprioceptive nerve supply to the oculo-motor muscles, what may the real function of these nerves be? Clearly they do not always serve to indicate through the muscle or muscles the exact position of the eyes; yet it may well be possible that they are concerned in giving information as to the state of innervation, and, still more, the state of change of innervation in these muscles. In other words, they may be end-organs, though possibly not the only end-organs, of an innervation sense. However closely analogous they may be to the ordinary muscle sense afferents, it seems unlikely that they are identical with these. Their interdependence on other factors indicate that they are, in the first place, mere adjuvants. And, in this connection, it is significant that Sherrington has found that "the proprioceptive afferents of the eye muscles at their exits from the central nervous system are, unlike the proprioceptive afferents of most muscles, not separated from the motor fibres." There are other difficulties in fully accepting Sherrington's extremely valuable explanations and suggestions which will probably occur to ophthalmologists. But the readers of this journal, who are specially interested in the complex subject which is so suggestively treated by Sherrington must be referred to his paper to be in a position to appreciate the force of the argument by which he seeks to associate a muscular sense with the other factors which subserve orientation.

GEORGE A. BERRY.

III.—TRAUMATIC HYPOPHYSEAL DYSTROPHIA ADIPOSA

Behr, Carl (Kiel). — On traumatic hypophyseal dystrophia adiposa with a note on the condition of opaque nerve fibres in descending optic atrophy. (Ueber traumatische hypophysäre Dystrophia adiposa nebst Bemerkungen über das Verhalten von markhaltigen Nervenfasern bei deszendierender Optikusatrophie.) *Klin. Monatsbl. f. Augenheilk.*, January, 1917.

Behr has recently had the rare opportunity of observing two cases of injury to the pituitary body in which the patients survived and developed typical dystrophia adiposa.

The first case was that of the attempted suicide of a 17 year old girl who shot herself with a small-bore revolver in the right temporal region. She had previously been a patient at the clinic and had a marked amount of opaque nerve fibres.

When first seen after the injury, the eye was greatly proptosed and the lids oedematous. Both pupils were widely dilated and there was a complete amaurosis. Owing to maniacal excitement she had to be put under restraint for some time. One month after the injury there was complete right and partial left ophthalmoplegia. She was completely blind. A slight amount of contraction could be obtained in the left pupil with concentrated light, but none in the right. Ophthalmoscopically the temporal half of the right disc was grey, while the nasal half still preserved some colour; vessels normal. A broad band of opaque nerve fibres, through which the vessels could be seen, was below the disc. The left disc was of a pale reddish colour and there were opaque nerve fibres below.

Radiography showed the bullet in the neighbourhood of the sphenoid close to the anterior wall of the sella Turcica. This structure was much thickened and splintered with two small fragments of the bullet.

Menstruation, which had previously been regular, after missing one period, became re-established. Six weeks after the injury, the left pupil showed pseudoparadoxic light reaction, contracting considerably after prolonged closing of the lids. In extreme abduction, also, this pupil contracted, and in fixation for near point it was possible to make out definite accommodation by retinoscopy. None of these effects could be observed on the right side. Since, in addition, pressure phosphenes and light appearances on faradisation existed on the left side, indicating that the conduction in the left optic nerve was not completely abolished, an attempt was made to remove the bullet, but this failed.

Three months later the atrophy had become more marked with smaller vessels, and the opaque nerve fibres were more transparent. About this time a great increase was noticed in the subcutaneous fat and the feet had grown larger. In eight months the body weight had increased 48 pounds. Menstruation had remained normal after the first disturbance and external genital characteristics were unaltered. The thickening of the walls of the sella Turcica, due to callus, were no longer visible by radiography.

It is noted that during the first month after the injury there was an increase of 3·5 cm. in the height which Behr thinks was a beginning gigantism, as also was the change in size of hands and feet. This effect ceased after nine months. Behr considers that the gigantism was the result of stimulation of the function of the anterior lobe of the hypophysis, while the over-development of fat followed the subsequent loss of function of the same part of that structure.

As regards the opaque nerve fibres, these remained perfectly clearly defined in the case of the left eye for two and the right for six months after the disc had become quite atrophic. Behr explains this difference between the two eyes as due to the more complete destruction of the conducting elements on the right side. The fact that the disc appeared completely atrophic before there was much alteration in the opaque nerve fibres, he considers indicates that destruction of the nerve sheath is not the primary cause of the paleness of the optic disc which is really to be attributed to vascular causes.

The second case was that of a 22 year old soldier who was struck on the head with a club. He had a superficial wound extending horizontally from behind the left ear for ten centimetres, in which the bone was exposed and the surface splintered. For a month after the injury he suffered from loss of memory, alexia, and sensory aphasia. He also had paresis of left oculomotor nerve and left optic atrophy when first seen by Behr three months after the injury. Visual fields, absolute right sided hemianopia. This improved later to a defect in the right temporal field, but left a typical bitemporal colour hemianopia with the dividing line passing through the fixation point. The oculo-motor paresis recovered and vision in both eyes was 6/6 six months after the injury. The left disc remained pale. Excessive fat development was first noticed three months after the injury. In nine months the weight had increased 50 lbs. This was unaccompanied by glycosuria, thirst, or affection of vaso-motor system. No definite change in the sella Turcica could be made out by radiography. Diet had no effect on the fat development, which was rapidly checked by the administration of pituitary gland substance. That the organic preparation was responsible for the improvement was shown by the effect of leaving it off, the weight immediately rising again.

The rest of the paper discusses the views of writers on the functions of the hypophysis with some account of other recorded cases.

Behr concludes that his cases support the view that overaction of the anterior lobe of the pituitary results in acromegaly, diminished development of fat and genital hypertrophy, while underaction produces the opposite effect.

A considerable bibliography accompanies the paper.

E. E. H.

IV.—TONOMETRY

McLean, William (New York).—Experimental studies in intra-ocular pressure and tonometry. *Arch. of Ophthal.*, Vol. XLVIII, No. 1, January, 1919.

This fascinating paper by **McLean** should be closely studied by all those who have learnt to value scientific tonometry. It first outlines the disadvantages of the existing tonometers, which are stated to be: (1) the distance between the foot-plate of the instrument and the reading scale; (2) the fact that the original readings are on an arbitrary scale; (3) the necessity for the translation of these readings by a chart which is none too easy to decipher; (4) the trouble in changing weights, and (5) the mechanical disadvantages of the plungers used, since the force of capillary attraction impairs the accuracy of the readings. After dealing with the various models of impression and applanation tonometers that have been before the profession, the writer describes his own instrument, which would appear to have many and great advantages. It has been graduated by the aid of experiments made on enucleated *human* eyes, the correct reading being indicated in each case by control experimentation with a water manometer, specially devised for the purpose. The most ingenious part of the apparatus is the needle employed and the device used to guard against any possibility of altering the original tension of the eye by the volume of the metal thrust into it for manometric purposes. McLean claims that with the exception of Weber and Wahlfors, he is the only man who has done experimental work on living human eyes by connecting the interior of an eye to a manometer. The importance of these experiments lies in the fact that "the large number of tests made on living eyes *in situ* agreed with the tests of those same eyes after enucleation." From this he infers that his "testing apparatus for enucleated eyes is fairly correct." Apart from having furnished us with an instrument a trial of which will be welcomed by all who value accurate tonometry, the inventor has incidentally made some

important discoveries. He finds both in man and animals, that the reading of the Schiötz tonometer is far too low as an expression of true intra-ocular pressure, though the disparity would appear to be greater in animal than in human eyes. In this he differs from the findings of Polak-van-Gelder, who stated as a result of experiments on animals, that the discrepancy between his tonometer (Schiötz) and manometer readings, was negligible, not more in fact than 1 mm. of mercury. Another new point made by McLean is that the induction of general anaesthesia by ether is productive of a marked fall in intra-ocular pressure. This was shown both by tonometer and manometer readings. Those who use the new instrument will have to accustom themselves to an entirely new conception of what the normal intra-ocular pressure should be taken to be. This, however, is far from being an insuperable objection. The paper is illustrated by clear diagrams and equally clear tables.

R. H. ELLIOT.

V.—REMEDIES

(1) **Richard, Paul (Médecin aide-major.)—The treatment of syphilis by galyl. (Le traitement de la syphilis par le galyl.)** *La Clin. Ophtal.*, August, 1917.

(1) Galyl is a French and not a German preparation of arsenic. This, at any rate according to Richard, is one very good reason for its use. He employs the drug in intravenous injections of concentrated solutions in accordance with the technique of Ravaut for neo-salvarsan. Large doses are avoided, the total quantity being 1.6 to 2 grammes in 35 to 45 days, by eight or ten injections. For after-treatment Richard gives six injections of 0.2 gramme each. The treatment is very well borne, and unless the technique has been imperfect, there is no induration of the vein. Some patients have a rise of temperature five or six hours after the first injection, but only when they are in the secondary stage of syphilis. The rise is not great (to 38.5 or 39 degrees Cent.), and does not recur at the second injection. Diarrhoea, properly so-called, does not occur, but there may be some slight looseness of the bowels. The author has not met with albuminuria and the drug seems to be without effect on the kidney. On the other hand, he has been most careful to eliminate cases of cardiac or aortic disease; such cases are not treated by galyl. Where there is non-syphilitic disease of the lungs, liver, spleen, kidneys, eyes, or ears, the treatment may be carried out with an extra amount of caution. In primary syphilis the chancre is very quickly affected by the drug, while, in the secondary stage, the evolution of the disease seems to be cut short when it is treated

in time. In fact, in the cases seen from the very beginning, and treated from the beginning, there has been neither rash nor affection of mucous membranes. The secondary rash yields rather slowly, eight to ten days. Mucous patches heal very quickly. Finally, it may be said that the author employs mercury concurrently, in the form of intramuscular injections of grey oil or intravenous injections of cyanide of mercury. These associated treatments are quite well borne.

ERNEST THOMSON.

(2) **Darier, A. (Paris).—On the value of gonococcic vaccines (Dmégon) in the treatment of purulent ophthalmia in the adult. (De la valeur des vaccins gonococciques (Dmégon) dans l'ophtalmie purulente de l'adulte.)** *La Clin. Ophtal.*, September, 1917.

(2) **Darier,** hitherto content with paraspecific serum therapy, has lately had occasion to try the antigonococcic vaccine of Nicolle and Blaizot which is named Dmégon. He had a very good result, and seems inclined to give the vaccine full credit; nevertheless, he employed local treatment as well (argyrol, ichthargan), and considers that, at any rate, the combination was excellent. It may be mentioned that according to an article dealing with Nicolle and Blaizot's work which is reproduced in this number of *La Clinique Ophtalmologique*, Dmégon is one of a series of vaccines prepared by these workers. There are two classes of such vaccines, the preventive and the curative. Belonging to the latter class are the antigonococcic Dmégon, antistaphylococcic Dmesta, antityphoid Dmedo, and the pertussis curative Dmeco. In the former (preventive) class are the antityphoid Drepado, the anticholera Drepachol, and the antidysenteric Drepadys. The Greek root *Dme* is reserved for the names of curative vaccines and the root *Drepa* for the preventive vaccines. These vaccines are called fluorised vaccines (*vaccines fluorurés*) and are stable, atoxic, and multivalent. The preserving fluid is an aqueous physiological solution of fluoride of sodium. Fluorides have the property of killing microbes without coagulating them. To this is due the stability of the vaccines. All these vaccines are prepared in such a way that the volume of microbic emulsion to be inoculated is half a cubic centimetre. This has two advantages. In the first place it prevents mistakes, and in the second place since the fluoride is slightly caustic, the less the volume of the fluoride the better. But since a dilute vaccine is better absorbed than a concentrated one, the amount of the vaccine is diluted with three times its volume of sterilized physiological saline. The vaccine and the dilutant are supplied ready in ampoules. The best method of use is intramuscularly.

The reviewer would like to remark that as a lucid summary of the nature of vaccines and sera, quite apart from these particular vaccines of Nicolle and Blaizot, the article transcribed in this number of

La Clinique Ophtalmologique to which reference has been made, would be very hard to beat. ERNEST THOMSON.

(3) **Domec, Th. (Dijon).—The treatment of various ocular affections by means of sterilized cow's milk injected intra-muscularly or hypodermically. (Traitement d'affections oculaires diverses, par le lait de vache stérilisé, en injections intra-musculaires ou hypodermiques.)** *La Clin. Ophtal.*, September and October, 1917.

(3) **Domec's** article is interesting but somewhat discursive. The author was attracted to the question of using cow's milk injections by the work of Müller and Tanner, of Vienna. What Domec has to say is almost entirely the result of clinical observation. Only in one instance were experiments on animals adopted as control. He has used these sterilized injections in a number of different eye affections where formerly, he would have used Roux serum, and apparently has been more satisfied with them than with the serum. The following is a list of the conditions which are specially referred to, namely, severe traumatic ulcer of cornea, traumatic and non-traumatic infective irido-choroiditis, post-operative infections, lacrymal abscess, eczematous kerato-conjunctivitis, hereditary specific keratitis. Having had very satisfactory results in these classes of cases, Domec then argued that as the milk injections seemed enormously to increase the defensive power of affected tissues, it might act in this way even though the cause were non-microbic. The proof that he was right in his supposition came to him in the form of a case of severe burn of the eyes by sulphuric acid. The milk injection treatment resulted in an almost complete absence of cicatricial tissue and consequent symblepharon, such an absence as he had never seen before under similar circumstances. In confirmation of this result experiments on animals (rabbits) were carried out, and it was found by comparing milk-injection-treated rabbits with non-treated, after the eyes had been injured by sulphuric acid, that the same remarkable absence of cicatricial tissue occurred in the treated animals as opposed to the untreated. Domec hopes that the treatment will be tried in the case of injuries by burning gas or liquid.

As to details of the preparation of the milk injections, the frequency of employment, the complications to be looked for and avoided (though these are few), the reader must refer to the original. The reviewer does not think he will find therein any very satisfactory explanation of the good effects of the milk injections.

ERNEST THOMSON.

(4) **Shahan, Wm. E. (St. Louis).—Corneal thermotherapy.** *Amer. Jl. of Ophthal.*, November, 1917.

(4) **Shahan's** article is apparently a sequel to a paper read at a

meeting of the American Medical Association at Detroit, 1916. At this meeting, Shahan introduced his "thermophore," an instrument for the application of regulated heat to the cornea, short, that is to say, of cauterization. The instrument is not illustrated in the present article. It consists essentially of "a resistance coil for generating heat, a sensitive zinc-iron regulating strip to admit or shut off electric current as more or less heat is needed, variously sized applicators for conducting the heat into variously sized areas of the cornea and a thermometer for measuring the intensity of the heat." The author describes certain experiments with low degrees of heat applied for some time, and with higher degrees for short periods. It was found that organisms (pneumococcus) could not be killed within the cornea by degrees of heat lower than that necessary to cause permanent clouding of the cornea. The method of prolonged application of low degrees of heat was therefore abandoned in favour of the one minute exposure. This minute unit was chosen because it was found that for any constant quantity of heat, the posterior surface of the cornea reached its maximum temperature in one minute. Increasingly higher degrees of heat were applied to virulent pneumococcus ulcers on rabbit's eyes, until a point was reached where the organisms were killed within the substantia propria. This point was 152° F. In a special series of experiments it was found that after one minute at 152° F. the epithelium was completely destroyed over an area somewhat greater than the facet of the applicator, and that the surface of the cornea was clouded so that the iris was scarcely visible through the heated area. The epithelium was replaced in four or five days, and the clouding slowly diminished to almost complete disappearance within six or eight weeks. The experiments had now reached a practical stage and the method was applied to serpiginous ulcers on human corneae. Since the application was to last only one minute, the complication of electric supply of heat could be abolished, and the instrument was simplified so that the core could be heated in a spirit or a Bunsen flame. Since the temperature in this modification of the instrument is constantly, though slowly, falling, the initial temperature has to be a little higher. The routine temperature found best by experience is 158° F. The action of the heat on the ulcer is threefold, namely, destruction of the organism, expulsion of dead bacteria and pus cells from the ulcerated surface, and corneal leucocytosis. The last does not appear till after the second or third day, and "can only be depended upon to take care of small and attenuated foci unaccompanied by pain or renewal of hypopyon." It is really not advisable to count upon leucocytosis to do much. "If the process is to be stopped abruptly and permanently by one application it is necessary to make the application with an initial temperature of 158° F. for one minute to

every part of the infected area. If the area is irregular or larger than the largest applicator surface, the application must be made to a part of the ulcer for one minute, the apparatus re-heated and an application made to another part of the ulcer, using differently sized applicator surfaces if necessary until the whole ulcer is completely covered." The author rightly points out that this method adds slightly to the quantity of scar tissue caused by the ulcer, increasing slightly the final opacity. This compared with the opacity caused by even a slight extension of the ulcer is "practically a negligble quantity." The author reserves this method for cases that will not heal in any other way. It should be considered as a "radical means of successfully overcoming a severe and dangerous form of progressively destructive ulceration that frequently leads to blindness, and should be reserved for the treatment of such conditions." Finally, the author describes the actual technique, which may here be condensed as follows, namely, thorough local anaesthesia; avoidance of all reference to "cautery" or "heat" when speaking to the patient about the operation, so as to obtain good fixation; the method of heating the core; application of argyrol when the heat application is completed, and of cocain and atropin when the patient complains of pain half an hour later. Should there be an exacerbation, this is to be treated by further application of heat. Atropin for the frequently occurring iritis is best applied in oily solution.

The thermophore can be obtained from Messrs. Erker Bros. Optical Company, 608, Olive Street, St. Louis.

ERNEST THOMSON.

(5) **Shahan, W. E. (St. Louis).—The Thermophore in ophthalmic practice.** *Trans. Amer. Ophthal. Soc.*, Vol. XVI (1918), p. 349.

(5) **Shahan** describes a modified thermophore, but the new instrument cannot be manufactured for general use until after the war.

S. S.

(6) **McPherson, G. (Bombay).—Note on the use of glare glasses.** *Trans. Ophthal. Soc. U.K.*, Vol. XXXVIII (1918), p. 282.

(6) **McPherson's** experiences in India and Mesopotomia have convinced him that smoked glasses should be worn under exceptional circumstances only, and that even then they should be but moderately tinted.

S. S.

(7) **Sweet, William M. (Philadelphia).—Tumour of the orbit, with extension to frontal and temporal regions, treated by x-rays.** *Trans. Amer. Ophthal. Soc.*, Vol. XVI (1918), p. 204.

(7) Three years after the surgical removal by **Sweet** of an

endothelioma, attached to the upper and inner wall of the orbit, which had perforated the bone, a swelling of the frontal bone was noticed, particularly of the outer portion, while the temporal bone also showed enlargement. The condition was treated by x-rays, in full therapeutic doses, for five minutes once a month, which succeeded in holding the process in check for several years, while, as shown by x-ray plates, regeneration of bone took place in the frontal region. The man, however, died with cerebral manifestations ten years after the first symptons of the orbital growth had been observed.

S. S.

CORRESPONDENCE

FACTORS IN STEREOSCOPIC VISION

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—I have read with great pleasure the interesting contribution of Dr. E. M. Eaton on "Factors in Stereoscopic Vision and the Visual Estimation of Distance," which appeared in the February number of the Journal. On repeating, however, the experiments with the stereoscope which he describes, I find I am unable to agree with his statements of fact, and consequently with the deductions therefrom.

If an ordinary stereoscopic photographic view be divided into two halves and the left half, *i.e.*, that part of the picture which is placed in the stereoscope opposite the left eye, be placed in the stereoscope opposite my left eye, I see it double. The view seen by the left eye is projected well towards the right, while the portion of the picture seen by the right eye is projected towards the position which the picture actually occupies. With the right half of the picture before the right eye, duplication occurs again, the projection being as already described. The two views in each case show distance and solidity very clearly indeed, the erroneously projected view being lighter than the other. If now the left half of the picture be placed in the stereoscope before the left eye and the right half of the picture brought forward so that the projected view of the left is overlapped by the correctly placed view of the right eye, the resultant view shows depth and solidity well marked. By reversing the pictures, the only difference I found between the perspective views due to one eye and that due to the use of two, was that the combined view was somewhat blurred in its fine details.

If we invert the right half and place it in that position before the left eye in the stereoscope, it is seen double again; but in this case the sense of perspective is faulty. In some cases there is no difficulty in interpreting the view for it can be compared to the reflection of hills in the still waters of a lake. In other cases another interpretation is possible, as in the "six are seven cubes" illusion; we interpret the shadows of the various objects in a wholly different manner, and an absolutely new picture starts into view. Not all of the old view appears in the new. Which of the two views will predominate when the second half of the original picture is inverted and approximated to that in the stereoscope will depend on circumstances. If, as already stated, the inverted right half is placed in the stereoscope before the left eye and the inverted left half is brought into its proper position before the right eye, the view obtained is the water view. With the inverted left half before the left eye and the inverted right approximated thereto in the stereoscope the alternative view becomes prominent, depth and solidity being very pronounced. The parts of the original picture which are not essential to the new view apparently come forward, causing a relative movement of the new view backward. The parts which move forward may be bits from the fore or background; in some cases they appear like a painted screen between the observer and the distant view and in some, if not in all, cases can be blocked out without altering the new view.

According to this rendering of the facts, the foreground is not thrown into the distance and distant objects brought forward when the inverted and reversed halves of a stereoscopic picture are seen in a stereoscope; but a new view is seen in which the fusion sense has full play in the ordinary acceptation of the term.

As a consequence, the experiment does not support the contention that "Our fusion sense appears to be extremely elastic and readily capable of compromise or even suppression."

Yours, etc.,

T. STEWART BARRIE, M.B., F.R.F.P.S.G.

13, SOMERSET PLACE,
GLASGOW, W.
20 February, 1919.

RING INFILTRATION OF THE CORNEA IN PLAGUE

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—In the December, 1918, issue of the BRITISH JOURNAL OF OPHTHALMOLOGY, page 612, Mr. D. V. Giri states that no case of acute general infection has been reported as a cause of ring

infiltration of the cornea. In the metastatic cases recorded there has been a localized focus of sepsis in some other part of the body.

I believe that the condition is not rare in severe septicaemic plague. Recently I saw ring abscess well marked in both corneae of a female plague patient. When I first saw her she was lying semi-conscious on the fourteenth day of the disease. The corneal infiltration was then definite, but it was more so, and yellowish in tint, two days later. She died on the seventeenth day. There was no evidence of suppuration elsewhere; the only bubo was a moderately enlarged gland, the size of an almond, in the left groin.

In Bombay, years ago, I was struck with the very marked shrinkage of the flattened cornea, down to as little as 3 mm., in atrophic eyeballs from plague endophthalmitis, seen at various intervals after recovery from the disease. Possibly, in these there may have been annular infiltration, which had resolved.

Yours, etc.,

H. HERBERT,
Lt.-Colonel, I.M.S.

A NEW FORM OF BIFOCAL LENS

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—Mr. Bardsley's ingenious scheme for solving the problem of the inclination of the lower segment of a bifocal combination is only of use for the limited case of those patients who are myopes and able to afford the very costly glass described by him. I wish to suggest that the problem may be attacked in another way. Percival, in his book, "The Prescribing of Spectacles," gives, on page 133, the necessary formulae for calculating the cylindrical effect of tilting a lens. A table might be drawn up from this showing the effect of tilting lenses of various strengths to an average reading inclination of 25°. All the surgeon would now require to do would be to refer to the table and prescribe a cylinder for the lower segment of the bifocal sufficient to neutralize the prismatic effect produced by the tilting. This method would be applicable to convex and concave lenses. I hope Mr. Bardsley, with the help of Dr. Fison, may consider the possibility of working out such a table. I must confess that I cannot trust my own mathematical talents to deal with the task.

I am, Sir, yours faithfully,

E. ERSKINE HENDERSON.

GAS INFECTION

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

DEAR SIR,—I see that Captain Pringle in his interesting paper on Gas Infection of the Cornea, published in your last number, draws attention to the absence of previously recorded cases of a similar nature; I assume that he is referring to cases which have occurred during the war; the subject of Gaseous Panophthalmitis is one to which I drew attention some years ago, and I believe that I am correct in stating that I was the first in this country to record such cases.

In the *Transactions, Ophthalmological Society, U.K.*, Vol. XXX, p. 179, will be found a short article, in which I gave the clinical history, and an account of the bacteriology of my first case of gaseous panophthalmitis, which occurred in 1909, while in the *Ophthalmic Review*, Vol. XXIX, p. 161, will be found the record of my second case. At the end of this second paper will be found references to similar cases in the literature, which were all that I could find at that time. In each of my cases the bacteriology of the condition was worked out by Dr. Charles Slater, now Consulting Bacteriologist to St. George's Hospital; I was not so fortunate as Captain Pringle in being able to watch the development of gas bubbles in the cornea. The experience of French surgeons at that time showed that it was perfectly safe to excise an eye in which gaseous panophthalmitis was present, though I am bound to admit, that in my first case I performed an evisceration.

Yours faithfully,

R. R. JAMES.

LONDON, *March* 4, 1919.

OBITUARY

Last month we announced with profound regret the sudden death of Richard A. Reeve, of Toronto. He was a fellow of the American College of Surgeons and held the degree of B.A. and LL.D. of Toronto and M.D. of Queen's. In 1872 he joined the Toronto General Hospital, where he practised ophthalmology, otology, rhinology, and laryngology, and even taught chemistry when occasion offered. He also held the post of professor of ophthalmology in the Toronto School of Medicine and later became professor of ophthalmology and otology when amalgamation took place between the University and the School of Medicine. For nearly

twenty years he was dean of the Faculty in the University, and much of his life and interest centered about that institution. Whilst he was dean the new medical buildings and the laboratories were erected, but his most notable achievement was perhaps the beautiful and well-designed Convocation Hall, for the building of which he was lavish in his expenditure of time and energy in collecting the necessary funds. The writer will not readily forget a long autumn afternoon spent with Reeve in wandering about the University for which he had done so much. His enthusiasm was unbounded, and he seemed to know every nook and cranny of the building, to say nothing of their history. Reeve wrote but little on ophthalmology, but he was a member of many societies devoted to that subject. He was a fluent and tactful speaker. He belonged to the American Ophthalmological Society, and in this country had been a vice-president of the Ophthalmological Society of the United Kingdom (1907-1910) and was an original member of the Oxford Ophthalmological Congress, at the meetings of which he was a frequent attendant. A man of the highest character Reeve was the incarnation of the spirit of tolerance. Although a total abstainer and a hater of the fumes of tobacco, he participated to the full in the social gatherings of any scientific society to which he belonged, and added no small quota to the general harmony by his aptitude for making a happy and felicitous speech. In 1906 he was President of the British Medical Association when that body met in Toronto. His domestic life was one long ideal, unhappily interrupted by the death of Mrs. Reeve some two years ago. He left no children. At the time of his death he was Emeritus Professor of Ophthalmology in the University of Toronto, and Past President of the British Medical Association. The esteem in which he was generally held may be gathered from the extract given below from the *University Monthly*, January, 1915, written at a time when he had withdrawn to the ranks of the professores emeriti of Toronto University: "and now this selfless man and stainless gentleman, this professional father and brother to every member of the faculty, our family guide, philosopher, and friend, our paragon and beau idéal of many years, carries with him into the comparative retirement of private practice our hopes, our prayers, our undying gratitude, our unstinted praises, our unfailing reverence and love. We have honoured him with the honour due unto him for the uses we have had of him, for his instrinsic worth, and because the Lord hath made him—His noblest work—an honest man."

The death of Lieut.-Col. William Watson, C.M.G., F.R.S., should not be allowed to pass unnoticed in our columns. Col. Watson was one of the Professors of Physics at the Imperial College

of Science, South Kensington, and it was here that he came in contact with Sir William Abney and assisted him in his work on colour vision. They published several papers of great interest and importance on this subject in the Proceedings of the Royal Society, and were engaged in further researches at the outbreak of war. Professor Watson was one of the secretaries of the Departmental Committee of the Board of Trade on sight tests for the Mercantile Marine, and the Board of Trade lantern now in use was designed almost entirely by him. This is not the place to do more than mention Professor Watson's work on the theory of the internal combustion engine, etc,, nor his military work—the latter being of a nature to give full scope to his scientific knowledge and originality and making demands upon his courage and endurance which were met literally to the death.

NOTES

Appointments

C. B. GOULDEN, late of Oldham, has been appointed assistant surgeon to the Royal London Ophthalmic Hospital. W. H. Brazil has been appointed ophthalmic surgen to the Stratford-upon-Avon General Hospital. C. Killick, late of Maidstone, has been appointed surgeon to the Bradford Royal Eye and Ear Hospital. Alfred E. A. Loosely has been appointed assistant surgeon in the ophthalmic out-patient department at the London Temperance Hospital.

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Oxford Ophthalmological Congress.

THE next meeting of the Oxford Ophthalmological Congress will be held on Thursday, July 10, and Friday, July 11, 1919. The first day will be largely taken up by a discussion on "Preventive Ophthalmology," to be opened by Colonel J. Herbert Parsons. The Annual General Meeting will take place on the evening of Thursday at Keble College, Oxford.

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German Kultur

THE picture post-card reproduced below tells its own tale.

LES ATROCITÉS ALLEMANDES EN BELGIQUE
Ruines de l'Institut Ophtalmique du Dr BRIBOSIA.
(Transformé en ambulance de la Croix-Rouge au début de la Guerre
Le 24 AOUT 1914, après la prise de Namur, les soldats Allemands envahirent l'ambulance, y mirent le feu et fusillèrent les soldats Belges et Français qui y étaient en traitement.

It was sent to this journal by Dr. Bribosia whose signature it bore.